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## SERVICE BULLETIN

N° **169-148**

# EMERGENCY ALERT

**DATE:** May 29, 2019

**REV. :** /

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## TITLE

**ATA 64 - TAIL ROTOR FLIGHT CONTROL IMPROVED PERIODICAL INSPECTION**

## REVISION LOG

First issue.

## **1. PLANNING INFORMATION**

### **A. EFFECTIVITY**

Part I: All AW169 helicopters.

Part II: All AW169 helicopters.

Part III: All AW169 helicopters.

Part IV: All AW169 helicopters.

Part V: All AW169 helicopters.

Part VI: All AW169 helicopters.

### **B. COMPLIANCE**

#### **Part I:**

Within 10 FH from last application of Part I of SB 169-135 or from the issue of this Service Bulletin, whichever occurs first. Then repeat the inspection every 10 FH.

#### **NOTE**

Every time it is required to perform Part II, accomplishment of Part I and of Part V on the same maintenance downtime, must be performed as a prerequisite. If Part III is required in the same maintenance downtime, it shall be performed lastly.

#### **Part II:**

Within 50 FH from last application of Part II of SB 169-135 or from the issue of this Service Bulletin, whichever occurs first. Then repeat the inspection every 50 FH.

#### **Part III:**

Within 20 FH from last application of Part III of SB 169-135 or from the issue of this Service Bulletin, whichever occurs first, then repeat the installation every 20 FH.

#### **Part IV:**

Within 10 FH from last application Part IV of SB 169-135 or from the issue of this Service Bulletin, whichever occurs first. Then repeat the inspection every 10 FH.

#### **NOTE**

Perform as a prerequisite Part I and Part IV.

If Part III is required in the same maintenance downtime, it shall be performed lastly.

#### **Part V:**

Within 10 FH from last application of Part I of SB 169-135 or from the issue of this Service Bulletin, whichever occurs first. Then repeat the inspection every 10 FH.

### NOTE

- After the first accomplishment of Part VI repeat Part VI phased with Part II, not exceeding 200FH from the first application of the Part VI. Then repeat every 200FH.
- Perform as a prerequisite the following parts in this defined sequence: Part I, Part IV, Part V and Part II. If Part III is required in the same maintenance downtime, it shall be performed lastly.

### Part VI:

Within 10 FH from last application of Part I of SB 169-135 or from the issue of this Service Bulletin, whichever occurs first. Then repeat the inspection every 200 FH.

## **C. CONCURRENT REQUIREMENTS**

This SB supersedes and replaces the SB 169-135.

## **D. REASON**

This Service Bulletin is issued in order to require the periodical inspection of the slippage marking of the back-end castellated nut of the TR servo-actuator and the periodical detailed inspection of the TR duplex bearing.

## **E. DESCRIPTION**

Following additional tests and the completion of the initial phase of the in service monitoring carried out on the AW169 and AW189 fleet, it has been confirmed that the introduction of a temperature monitoring represents an effective independent measure to confirm the health of the TR bearing. In addition a refinement of the current inspection schedule is required with this SB along with the introduction of an additional instruction for duplex bearing roughness check.

This Service Bulletin provides the instructions for the above together with the transition to the new inspection regime.

In details Part I of this Service Bulletin provides the periodical detailed inspection of the slippage marking of the castellated nut installed on the back end of the TRA.

Part II partly retains the requirement of the Part II of the SB 169-135 defining the required detailed inspection requirement of TR duplex bearing.

Part III provides the instructions to install a dedicated thermal strip in the area of the TR duplex bearing.

Part IV provides the instructions to recursively check the thermal strip.

Part V requires the verification of metallic particle presence in the grease that could be found on the visible part of the duplex bearing. This check was already present in the Part II of the SB 169-135 and it is now confirmed with a tighter compliance.

Part VI prescribes an additional roughness check of the duplex bearing to be performed after removal of the spider assembly.

Incorrect installation of the TR servo-actuator back-end nut or seizure of the TR duplex bearing may lead to loss of Tail Rotor control which, depending on the flight condition, could lead to loss of control of the aircraft.

Feedback on the compliance to this Service Bulletin is required.

## **F. APPROVAL**

The technical content of this Service Bulletin is approved under the authority of DOA nr. EASA.21.J.005. For helicopters registered under other Aviation Authorities, before applying the Service Bulletin, applicable Aviation Authority approval must be checked within Leonardo Helicopters customer portal.

E.A.S.A. states mandatory compliance with inspections, modifications or technical directives and related time of compliance by means of relevant Airworthiness Directives.

If an aircraft listed in the effectivity embodies a modification or repair not LHD certified and affecting the content of this Service Bulletin, it is responsibility of the Owner/Operator to obtain a formal approval by Aviation Authority having jurisdiction on the aircraft, for any adaptation necessary before incorporation of the present Service Bulletin.

## **G. MANPOWER**

To comply with this Service Bulletin the following MMH are deemed necessary:

Part I: approximately one (0.5);

Part II: approximately three (3);

Part III: approximately half (0.5);

Part IV: approximately one (1);

Part V: approximately one (0.5);

Part VI: approximately three (3);

MMH are based on hands-on time and can change with personnel and facilities available.

## H. WEIGHT AND BALANCE

N.A.

## I. REFERENCES

### 1) PUBLICATIONS

<u>DATA MODULE</u>	<u>DESCRIPTION</u>	<u>PART</u>
DM01 69-A-00-20-00-00A-120A-A	Helicopter on ground for a safe maintenance.	I, II, III, IV, V, VI
DM02 69-A-06-40-00-00A-010A-A	Access door provision	I, II
DM03 69-A-64-31-01-00A-520A-A	Pitch link - Remove procedure	II
DM04 69-A-64-21-05-00A-520A-A	Lightning conductor jumper – Remove procedure	II
DM05 69-A-64-31-03-00A-520A-A	Spider plug - Remove procedure	II, III, IV, V, VI
DM06 69-A-64-31-03-00A-720A-A	Spider plug - Install procedure	II, III, IV, V, VI
DM07 69-A-64-31-02-00A-520A-A	Scissors group – Remove procedure	II
DM08 69-A-64-31-07-00A-520A-A	Boot - Remove procedure	II
DM09 69-A-64-31-04-00A-520A-A	Sliding control assy – Remove procedure	II, VI
DM10 69-A-64-31-04-00A-720A-A	Sliding control assy – Install procedure	II, VI
DM11 69-A-64-31-05-00A-520A-B	Duplex bearing - Remove procedure	II, IV, V, VI
DM12 69-A-64-31-05-00A-720A-B	Duplex bearing - Install procedure	II, IV, V, VI

### 2) ACRONYMS

SB	Service Bulletin
DM	Data Module
DOA	Design Organization Approval
EASA	European Aviation Safety Agency
LHD	Leonardo Spa Helicopters
MMH	Maintenance Man Hours
SB	Service Bulletin
FH	Flight Hours

TR Tail Rotor  
TRA Tail Rotor Actuator

### **3) ANNEX**

Annex A UTC AEROSPACE SYSTEMS SB 67-0006.

## **J. PUBLICATIONS AFFECTED**

N.A.

## **K. SOFTWARE ACCOMPLISHMENT SUMMARY**

N.A.

## 2. MATERIAL INFORMATION

### A. REQUIRED MATERIALS

#### 1) PARTS

Refer to AW169 IPD for the spares materials required to comply with the AMP DMs referenced in the accomplishment instructions.

#### 2) CONSUMABLES

The following consumable materials, or equivalent, are necessary to accomplish this Service Bulletin:

#	Spec./LHD code number	DESCRIPTION	Q.TY	NOTE	PART
1	Thermax 8 Level strip indicator code No.26805	Thermal strip	AR	(1)(2)(3)	III,IV
2	TT-N-95-B / Code No. 531055030	Aliphatic Naphtha (C059)	AR	(1)	III,IV

Refer to AW169 AMDI for the consumables required to comply with the AMP DMs referenced in the accomplishment instructions.

#### 3) LOGISTIC MATRIX

N.A.

#### NOTE

- (1) Item to be furnished as local supply.
- (2) Thermal strip Thermax 5 Level clock style indicator code No.26004 may be used as a valid alternative.
- (3) The use of further alternative strip is allowed provided that it complies with the following requirements:
  - Irreversible temperature indication.
  - Self-Adhesive.
  - Temperature Range shall be included within 100°C – 160°C provided that it shows a discrete level at 121±2°C.
  - Overall measurement accuracy: ±2°C.
  - The maximum allowed length to prevent overlap is 80 mm.

In case any clarification is needed, contact the Product Support Engineering ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)).

## **B. SPECIAL TOOLS**

Refer to ITEP for the special tools required to comply with the AMP DMs referenced in the accomplishment instructions.

## **C. INDUSTRY SUPPORT INFORMATION**

Owners/Operators who comply with the instructions of this Service Bulletin no later than the applicable date in the "Compliance" section will be eligible to receive REQUIRED MATERIALS on free of charge basis, except for Consumable Materials and Special Tools.

NOTE: Customers who fail to comply with the instructions in this Service Bulletin before the compliance date are not eligible for the aforementioned special policy.

Please Issue relevant MMIR form to your Warranty Administration Dpt.

NOTE: WRM will include RETURN MATERIAL AUTHORIZATION (RMA) number; the unit disembarked from the aircraft has to be returned to LHD within thirty (30) calendar days after the shipment of the replacement part. In case of missing return within thirty (30) calendar days, Customer will be invoiced for the price of the replacement part.

### **3. ACCOMPLISHMENT INSTRUCTIONS**

#### **GENERAL NOTES**

- a) Place an identification tag on all components that are re-usable, including the attaching hardware that has been removed to gain access to the modification area and adequately protect them until their later re-use.

#### **PART I**

1. In accordance with AMP DM 69-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.
2. In accordance with AMP DM 69-A-06-40-00-00A-010A-A remove the access panels 470AT and 470BT.
3. Take a picture of the back-end area of the TRA clearly showing the whole slippage mark (use Figure 3 as a reference for the picture to be taken), and keep a record in a local archive to be made available if required.
4. Check the slippage mark on the castellated nut for absence of evidence of rotation between the parts. Record the result on Table I (refer to Figure 7).
5. If any evidence of rotation is found, contact the Product Support Engineering ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)), wait for further instructions and perform the following checks:
  - 5.1 Perform Part II of this SB;
  - 5.2 Perform Part V of this SB;
  - 5.3 Send the picture taken while performing step 3.
6. If no evidence of rotation is found in step 4, return the helicopter to a ready to flight condition and record for compliance with Part I of this Service Bulletin on the helicopter logbook.

#### **NOTE**

Feedback on SB application is required within 2 days  
also in case of no findings.

7. Send the attached compliance form and the compiled Table I to the following mail box:  
[pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)

As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication".

## **PART II**

1. In accordance with AMP DM 69-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.

### **NOTE**

If not damaged, the O-ring removed in the following step can be retained for later reinstallation.

2. In accordance with AMP DM 69-A-64-31-03-00A-520A-A, remove the spider plug.
3. In accordance with AMP DM 69-A-64-31-01-00A-520A-A, remove all the pitch links from the TR.
4. In accordance with applicable steps of AMP DM 69-A-64-31-02-00A-520A-A, disconnect the upper half scissors from the spider.
5. In accordance with applicable steps of AMP DM 69-A-64-31-07-00A-520A-A, disconnect and lower the boot from the spider.
6. In accordance with AMP DM 69-A-64-21-05-00A-520A-A, disconnect the TR lightning conductor jumper.
7. Perform the inspection of the TR duplex bearing in accordance with the following procedure:
  - 7.1 Inspect the visible part of the TR duplex bearing (including the seals) for signs of wear, damages and security of attachment. Record the results on Table II (refer to Figure 8).
  - 7.2 Check for absence of axial play when trying to move the spider along the control rod axis. Record the result on Table II (refer to Figure 8).

### **NOTE**

With reference to Figure 2 View B and Detail C, apply a  $25 \pm 2.5$  N upward force on the squared rod end by means of a dynamometer while performing the instructions reported in steps from 7.3 to 7.7. It is allowed to apply the force either pushing or pulling the rod end with the dynamometer.

- 7.3 Perform at least three (3) complete and continuous revolutions of the spider both in clockwise and in counterclockwise directions and verify that the spider has a free and easy rotation. Record the result on Table II (refer to Figure 8).
- 7.4 Put one arm of the spider along the vertical position; locate a dynamometer gauge on the spider arm hole (pitch link upper bolt location). Hold the gauge perpendicular to the spider arm surface. Gently push rightward the device until a

- slight rotation of the spider occurs (see Figures 1 and 2 for further details and dynamometer positioning). Record the force measured on Table II (refer to Figure 8).
- 7.5 Repeat step 7.4 for the opposite spider rotation on the same arm, pushing leftward the dynamometer gauge from the vertical position of the spider arm. Record the force measured on Table II (refer to Figure 8).
  - 7.6 Repeat steps 7.4 and 7.5 for all the other two spider arms.
  - 7.7 The force detected by dynamometer on steps 7.4 thru 7.6 shall be measured within 1.6 N and 8.8 N.
8. If none of the checks performed in step 7 fails proceed as follows, otherwise skip to step 9.
    - 8.1 In accordance with AMP DM 69-A-06-40-00-00A-010A-A remove the access panels 470AT and 470BT.
    - 8.2 Check the slippage mark on the castellated nut for absence of evidence of rotation between the parts. If any evidence of rotation is found, immediately contact the PSE ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) and wait for further instructions.
    - 8.3 Skip to step 15.
  9. If one of the checks performed from step 7.1 to 7.2 fails skip to step 11, otherwise proceed with the following step 10.
  10. If one of the checks performed from step 7.3 to step 7.7 fails proceed as follows:
    - 10.1 Perform the cleaning procedure of the sliding control assy in accordance with the following procedure:
      - 10.1.1 In accordance with AMP DM 69-A-06-40-00-00A-010A-A remove the access panels 470AT and 470BT.
      - 10.1.2 In accordance with the applicable steps of UTC SB 67-0006, remove and discard the cotter pin and the lockwire from the castellated nut of the TRA back-end and loosen the nut.
      - 10.1.3 In accordance with applicable steps of AMP DM 69-A-64-31-04-00A-520A-A, remove the sliding control assy.
      - 10.1.4 Clean the external surface of the sliding control assy by means of soft lint-free cloth.
      - 10.1.5 Clean the accessible internal surface of the slider bushing by means of soft lint-free cloth.
      - 10.1.6 In accordance with applicable steps of AMP DM 69-A-64-31-04-00A-720A-A, reinstall the sliding control assy.

- 10.1.7 In accordance with the applicable steps of UTC SB 67-0006, reinstall castellated nut of the TRA back-end and cotter pin P/N EN2367-29020 and lockwire P/N MS20995C20.
- 10.1.8 Restore the slippage marking on the castellated nut from the hinge bracket element to the rod.
- 10.2 Repeat steps from 7.2 to 7.7 to verify the absence of axial play of TR duplex bearing and to perform again the roughness and breakaway force checks of TR duplex bearing.
- 10.3 If any of the checks performed in step 10.2 fails proceed with the following step 11, otherwise skip to step 15.
- 11. Contact immediately the Product Support Engineering ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) to receive further instruction before performing the replacement of the TR duplex bearing in accordance with the following procedure:
  - 11.1 In accordance with the applicable steps of UTC SB 67-0006, remove and discard the cotter pin and the lockwire from the castellated nut of the TRA back-end and loosen it.

#### **NOTE**

Before removal of the TR duplex bearing, take note of its installation orientation marking "OUT" on the outboard visible face.

After removal mark "IN" on the inboard opposite face of the TR duplex bearing.

Use an indelible pen.

- 11.2 In accordance with AMP DM 69-A-64-31-05-00A-520A-B, remove the TR duplex bearing.
- 11.3 Collect the grease leaked from the TR duplex bearing "IN" marked side in a container different from the one used before.
- 11.4 Take a picture of both faces of the removed TR duplex bearing and send them to PSE ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) before returning the bearing.
- 11.5 In accordance with AMP DM 69-A-64-31-05-00A-720A-B, install a new TR duplex bearing.
- 11.6 In accordance with the applicable steps of UTC SB 67-0006, reinstall castellated nut of the TRA back-end and cotter pin P/N EN2367-29020 and lockwire P/N MS20995C20.

- 11.7 Restore the slippage marking on the castellated nut from the hinge bracket element to the rod.
12. In case replacement of the TR duplex bearing is required, please return immediately (within 2 days) the removed TR duplex bearing and the collecting containers of the grease to Leonardo Helicopters. Contact the Product Support Engineering ( [pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) to receive the proper instructions to return the removed component.

**NOTE**

When performing the following step it is allowed to cure the sealant required by the AMP DM 69-A-64-31-03-00A-720A-A for 2 hours only before flight.

13. In accordance with AMP DM 69-A-64-31-03-00A-720A-A, install the spider plug.

**NOTE**

Feedback on SB application is required within 2 days also in case of no findings.

14. Send the attached compliance form and the compiled Table II to the following mail box:  
[pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)

As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication".

15. Return the helicopter to a ready to flight condition and record for compliance with Part II of this Service Bulletin on the helicopter logbook.

### **PART III**

1. In accordance with AMP DM 69-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.
2. In accordance with AMP DM 69-A-64-31-03-00A-520A-A, remove the spider plug.
3. With reference to Figure 4, perform the installation of thermal strip Thermax 8 level strip No.26805 or equivalent as follows:
  - 3.1 Clean the spacer control rod P/N 4F6430A02551 surface with aliphatic naphtha.
  - 3.2 With reference to Figure 5, if the selected thermal strip exceeds the height of 16 mm it shall be cut taking care not to remove the Celsius scale and not to damage the sensitive elements of the strip.

#### **CAUTION**

When installing the thermal strip pay attention to:

- avoid contact with bearing gaskets;
- ensure a good adhesion with the spacer control rod P/N 4F6430A02551;
- all temperature indicators of the thermal strip shall be visible.

#### **CAUTION**

If thermal strip trimming is required, confirm that the cut did not cause debonding of strip layers.

- 3.3 With reference to Figure 4, with the help of a non metallic spatula, perform the installation of the thermal strip on the surface of the spacer control rod P/N 4F6430A02551.

#### **NOTE**

When performing the following step it is allowed to cure the sealant required by the AMP DM 69-64-31-03-00A-720A-A for 2 hours only before flight.

4. In accordance with AMP DM 69-A-64-31-03-00A-720A-A, install the spider plug.
5. Return the helicopter to a ready to flight condition and record for compliance with Part III of this Service Bulletin on the helicopter logbook.
6. Send the attached compliance form to the following mail box:

[pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)

As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication".

#### **PART IV**

1. In accordance with AMP DM 69-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.
2. In accordance with AMP DM 69-A-64-31-03-00A-520A-A, remove the spider plug.
3. With reference to Figure 4, check the thermal strip for good adhesion and readability and proceed as follows:
  - 3.1 If the thermal strip is properly installed proceed with step 4;
  - 3.2 If the strip is detached, partially detached or unreadable perform the TR duplex bearing inspection in accordance with accomplishment instructions from step 3 to step 14 of Part II of this SB;
  - 3.3 Replace the thermal strip in accordance with step 3 of Part III of this SB;
  - 3.4 Skip to step 6.

#### **CAUTION**

In case the selected thermal strip does not provide a discrete value equal to 121°C, select the lowest value comprised within the range 121±2°C.

4. With reference to Figure 4, check the temperature reached by the thermal strip installed on spacer control rod P/N 4F6430A02551. Make sure that the temperature has not reached a value equal to or above 121°C. Record the check result on Table III (refer to Figure 9).
5. If temperature has exceeded a value equal to or above 121°C, perform the following steps, otherwise skip to step 6:
  - 5.1 Contact immediately the Product Support Engineering ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) to receive further instruction before to remove and replace the thermal strip and the duplex bearing.
  - 5.2 Perform from step 3 to step 14 of Part II of this SB.
  - 5.3 Perform from step 3 to step 9 of Part V of this SB.
  - 5.4 Remove the spacer control rod P/N 4F6430A02551, without removing the thermal strip.
  - 5.5 Take a picture of the thermal strip, installed on the removed spacer control rod P/N 4F6430A02551 and send it to PSE ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)).
  - 5.6 In accordance with the applicable steps of UTC SB 67-0006, remove and discard the cotter pin and the lockwire from the castellated nut of the TRA back-end and loosen it.

### NOTE

Before removal of the TR duplex bearing, take note of its installation orientation marking "OUT" on the outboard visible face.

After removal mark "IN" on the inboard opposite face of the TR duplex bearing.

Use an indelible pen.

- 5.7 In accordance with AMP DM 69-A-64-31-05-00A-520A-B, remove the TR duplex bearing.
- 5.8 Collect the grease leaked from the TR duplex bearing "IN" marked side in a container different from the one used before.
- 5.9 Take a picture of both faces of the removed TR duplex bearing and send them to PSE ( [pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) before returning the bearing.
- 5.10 In accordance with AMP DM 69-A-64-31-05-00A-720A-B, install a new TR duplex bearing.
- 5.11 In accordance with the applicable steps of UTC SB 67-0006, reinstall castellated nut of the TRA back-end and cotter pin P/N EN2367-29020 and lockwire P/N MS20995C20.
- 5.12 Restore the slippage marking on the castellated nut from the hinge bracket element to the rod.
- 5.13 In case replacement of the TR duplex bearing is required, please return immediately (within 2 days) the removed TR duplex bearing, the collecting containers of the grease and the thermal strip to Leonardo Helicopters. Contact the Product Support Engineering ( [pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) to receive the proper instructions to return the removed component.
- 5.14 Go to Step 6.

**NOTE**

When performing the following step it is allowed to cure the sealant required by the AMP DM 69-64-31-03-00A-720A-A for 2 hours only before flight.

6. In accordance with AMP DM 69-A-64-31-03-00A-720A-A, install the spider plug.
7. Return the helicopter to a ready to flight condition and record for compliance with Part IV of this Service Bulletin on the helicopter logbook.

**NOTE**

Feedback on SB application is required also in case of no findings within 2 days.

8. Send the attached compliance form and the compiled Table III to the following mail box:  
[pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)

As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication".

## **PART V**

1. In accordance with AMP DM 69-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.

### **NOTE**

If not damaged, the O-ring removed in the following step can be retained for later reinstallation.

2. In accordance with AMP DM 69-A-64-31-01-00A-520A-A, remove the spider plug.
3. Perform a detailed inspection of the TR duplex bearing in accordance with the following procedure:
  - 3.1 Check the visible part of the TR duplex bearing for particles absence.

### **CAUTION**

Pay attention not to damage the thermal strip during the grease sampling from the bearing housing.

- 3.2 Check the visible part of the TR duplex bearing and/or the spider plug for grease leakage and confirm absence of any particles by finger touch.
  - 3.3 Put a small quantity of grease using a small spatula in a transparent container and add a solvent (aliphatic naphtha). Then by using a magnet on the bottom outside of the container check for presence of magnetic particles.
  - 3.4 Record the result on Table IV (refer to Figure 10) and collect the grease leaked from the visible surface in a proper container.
4. If magnetic and/or any other particles are found during accomplishment of step 3 proceed with steps 6, otherwise skip to step 8.
5. Perform from step 3 to step 14 of Part II of this SB.
6. Contact immediately the Product Support Engineering ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) to receive further instruction before performing the replacement of the TR duplex bearing in accordance with the following procedure:
  - 6.1 In accordance with the applicable steps of UTC SB 67-0006, remove and discard the cotter pin and the lockwire from the castellated nut of the TRA back-end and loosen it.

### NOTE

Before removal of the TR duplex bearing, take note of its installation orientation marking "OUT" on the outboard visible face.

After removal mark "IN" on the inboard opposite face of the TR duplex bearing.

Use an indelible pen.

- 6.2 In accordance with AMP DM 69-A-64-31-05-00A-520A-B, remove the TR duplex bearing.
  - 6.3 Collect the grease leaked from the TR duplex bearing "IN" marked side in a container different from the one used before.
  - 6.4 Take a picture of both faces of the removed TR duplex bearing and send them to PSE ( [pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) before returning the bearing.
  - 6.5 In accordance with AMP DM 69-A-64-31-05-00A-720A-B, install a new TR duplex bearing.
  - 6.6 In accordance with the applicable steps of UTC SB 67-0006, reinstall castellated nut of the TRA back-end and cotter pin P/N EN2367-29020 and lockwire P/N MS20995C20.
  - 6.7 Restore the slippage marking on the castellated nut from the hinge bracket element to the rod.
7. In case replacement of the TR duplex bearing is required, please return immediately (within 2 days) the removed TR duplex bearing and the collecting containers of the grease to Leonardo Helicopters. Contact the Product Support Engineering ( [pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) to receive the proper instructions to return the removed component.

### NOTE

When performing the following step it is allowed to cure the sealant required by the AMP DM 69-64-31-03-00A-720A-A for 2 hours only before flight.

8. Clean the visible surface of the TR duplex bearing by means of soft lint-free cloth.
9. In accordance with AMP DM 69-A-64-31-03-00A-720A-A, install the spider plug.
10. Return the helicopter to a ready to flight condition and record for compliance with Part V of this Service Bulletin on the helicopter logbook.

**NOTE**

Feedback on SB application is required also in case of  
no findings within 2 days.

11. Send the attached compliance form and the compiled Table IV to the following mail box:

[pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)

As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication"

## **PART VI**

1. In accordance with AMP DM 69-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.
2. In accordance with applicable steps of AMP DM 69-A-64-31-04-00A-520A-A, remove the sliding control assembly.
3. Inspect the visible part of the inboard side of the TR duplex bearing (including the seals) for signs of wear, damages and absence of particles by looking inside the slider cylinder. Record the results on Table V (refer to Figure 11).
4. With reference to Figure 11 lock the slider of the sliding control assembly in a bench vice with padded jaws.
5. Examine the duplex bearing to find roughness in accordance with the following procedure:

### **NOTE**

- To initiate rotation of the duplex bearing, a break-out force could be necessary. The break-out force is not an indication of roughness.
- Relative axial movement between the inner races is acceptable and shall not be considered as a finding.

- 5.1 Use your fingers to push down on the upper face of the inner race of the duplex bearing.

### **NOTE**

Do not release pressure, continue to apply pressure with your fingers during the subsequent step.

- 5.2 With reference to Figure 6 section A-A Step 1, push the top inner race down and at the same time turn it to feel if there is roughness.
- 5.3 Put your finger into the duplex bearing until you can pull up the lower face of the inner race.

### **NOTE**

Do not release pressure, continue to apply pressure with your finger during the subsequent step.

- 5.4 With reference to Figure 6 section A-A Step 2, pull the bottom inner race in the up direction and at the same time turn it to feel if there is roughness.
- 5.5 Repeat the Step 5.1 thru Step 5.4 at least one time to confirm the results.
- 5.6 Record the results of the previous steps on Table V (refer to Figure 11).

6. If the check performed in the step 5 fails proceed with the following step, otherwise skip to step 9.
7. Contact immediately contact the Product Support Engineering ([pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) to receive further instruction before performing the replacement of the TR duplex bearing in accordance with the following procedure:
  - 7.1 In accordance with the applicable steps of UTC SB 67-0006, remove and discard the cotter pin and the lockwire from the castellated nut of the TRA back-end and loosen it.

**NOTE**

Before removal of the TR duplex bearing, take note of its installation orientation marking "OUT" on the outboard visible face.

After removal mark "IN" on the inboard opposite face of the TR duplex bearing.

Use an indelible pen.

- 7.2 In accordance with AMP DM 69-A-64-31-05-00A-520A-B, remove the TR duplex bearing.
- 7.3 Collect the grease leaked from the TR duplex bearing "IN" marked side in a container different from the one used before.
- 7.4 Take a picture of both faces of the removed TR duplex bearing and send them to PSE ( [pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) before returning the bearing.
- 7.5 In accordance with AMP DM 69-A-64-31-05-00A-720A-B, install a new TR duplex bearing.
- 7.6 In accordance with the applicable steps of UTC SB 67-0006, reinstall castellated nut of the TRA back-end and cotter pin P/N EN2367-29020 and lockwire P/N MS20995C20.
- 7.7 Restore the slippage marking on the castellated nut from the hinge bracket element to the rod.
8. In case replacement of the TR duplex bearing is required, please return immediately (within 2 days) the removed TR duplex bearing and the collecting containers of the grease to Leonardo Helicopters. Contact the Product Support Engineering ( [pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)) to receive the proper instructions to return the removed component.
9. In accordance with applicable steps of AMP DM 69-A-64-31-04-00A-720A-A, reinstall

the sliding control assembly.

10. Return the helicopter to a ready to flight condition and record for compliance with Part VI of this Service Bulletin on the helicopter logbook.

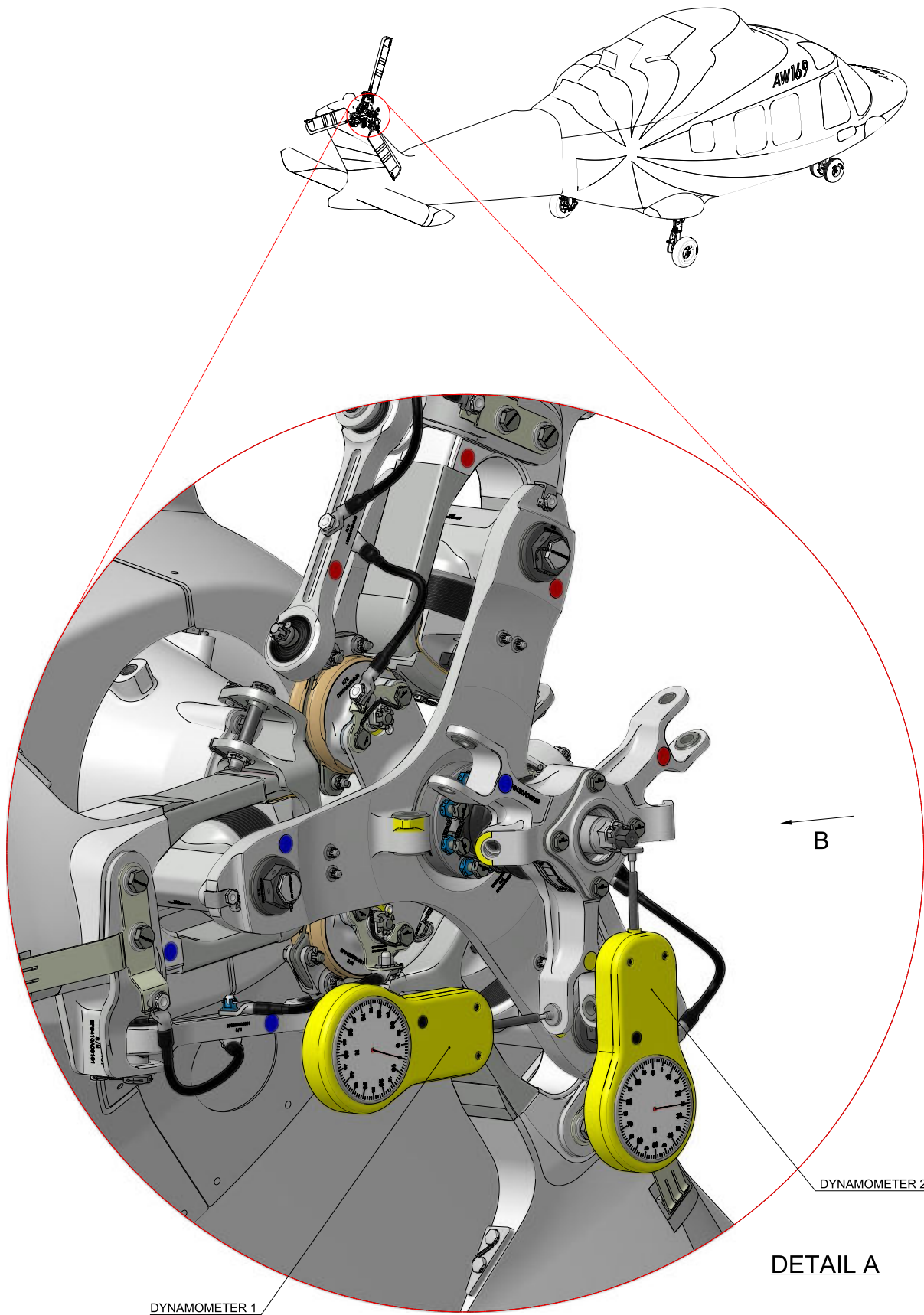
**NOTE**

Feedback on SB application is required also in case of  
no findings within 2 days.

11. Send the attached compliance form and the compiled Table V to the following mail box:

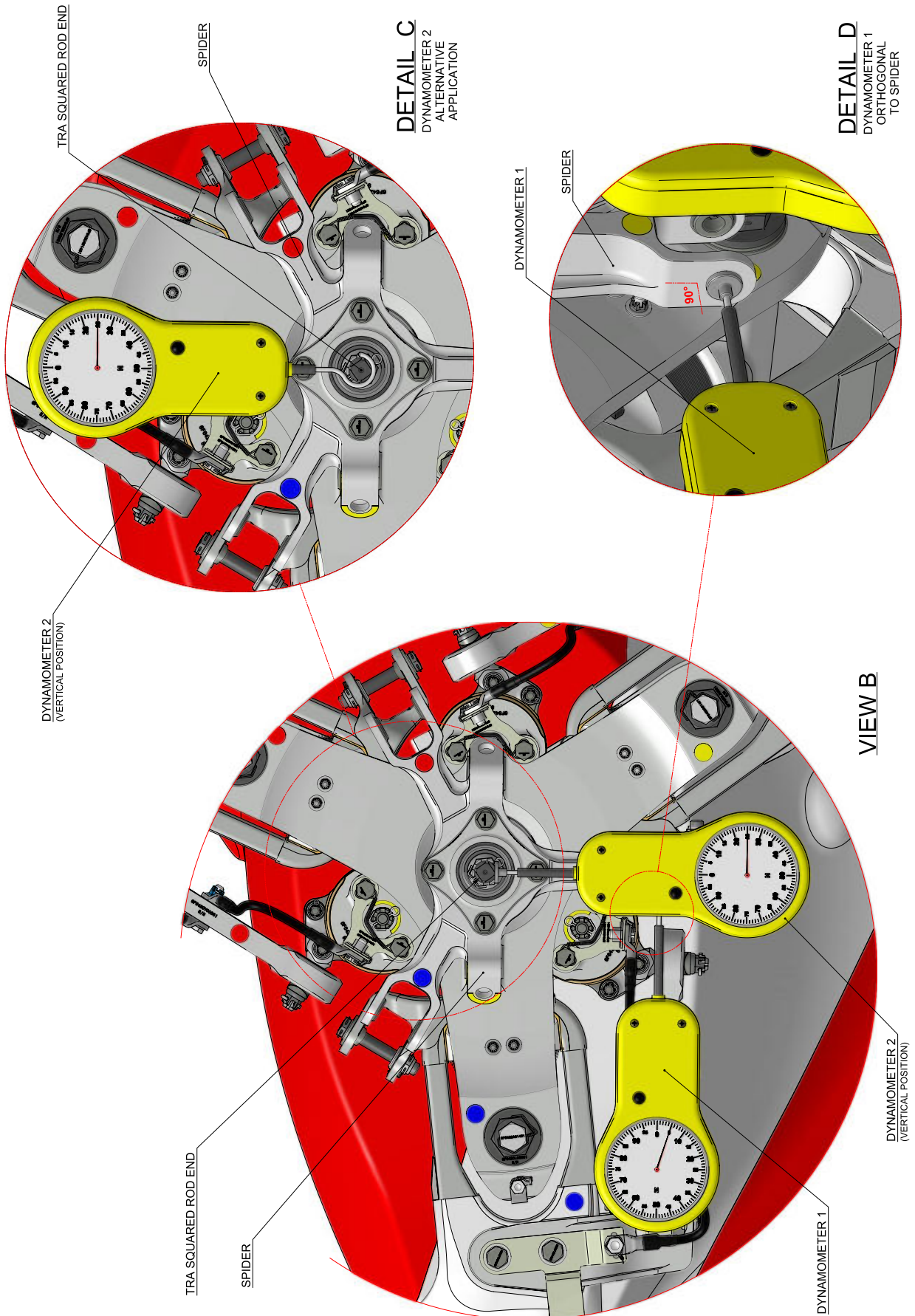
[pse\\_aw169.mbx.aw@leonardocompany.com](mailto:pse_aw169.mbx.aw@leonardocompany.com)

As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication".



**Figure 1**

S.B. N°169-148 EMERGENCY ALERT  
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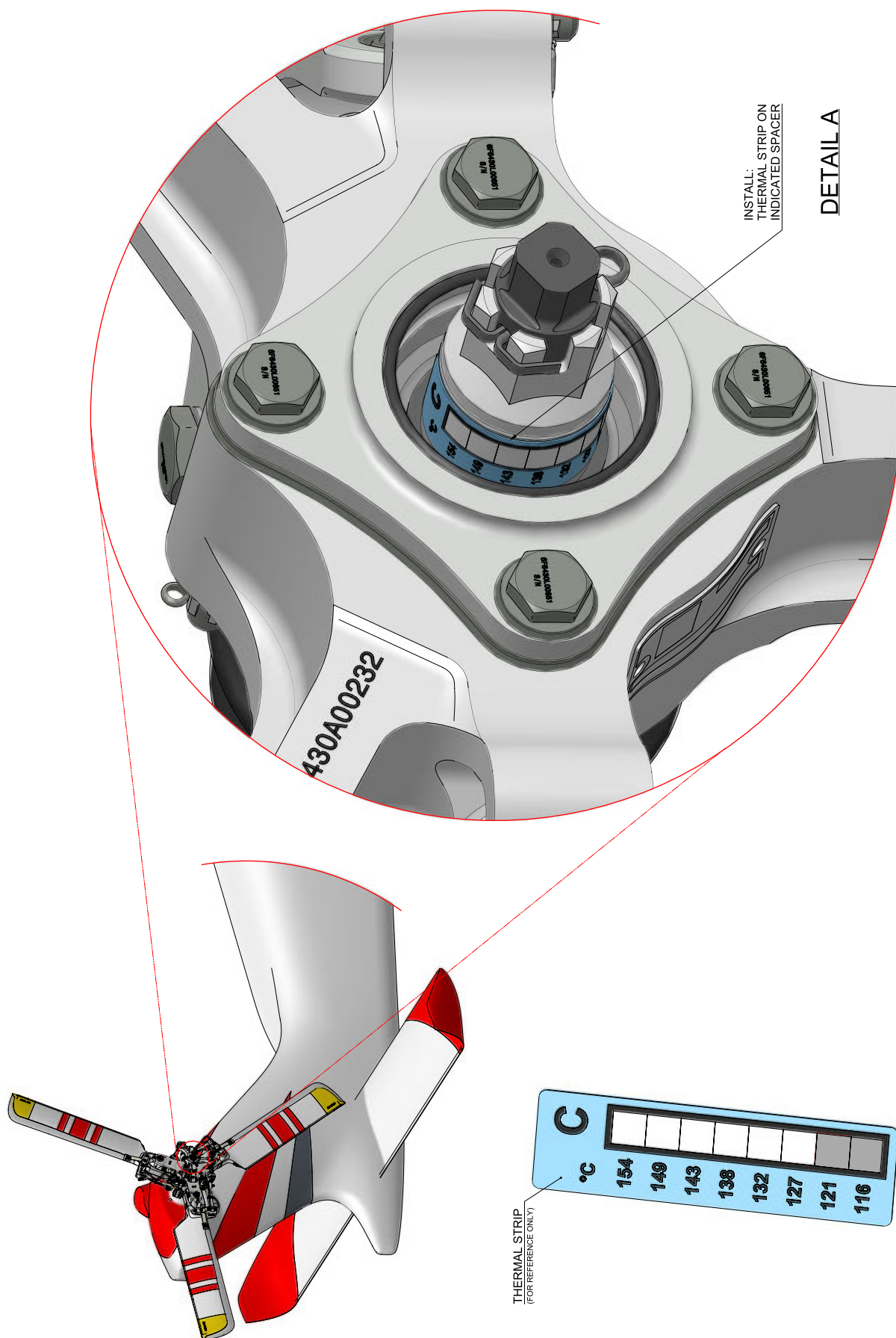


**Figure 2**

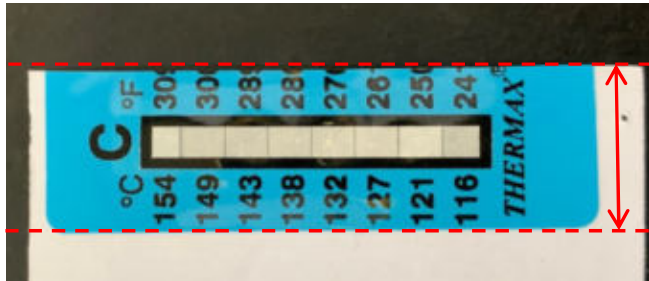


**Figure 3**

S.B. N°169-148 EMERGENCY ALERT  
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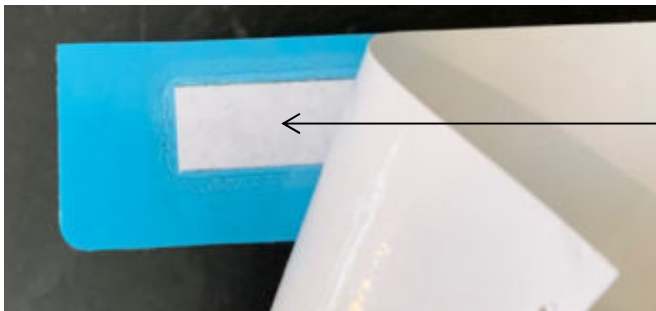
**Figure 4**



16mm

Cutting line. Pay attention to not cut the degree Celsius scale.

Limit cutting at the minimum required to obtain 16mm of height.



Pay attention to not damage or to expose to the environment the sensitive elements.

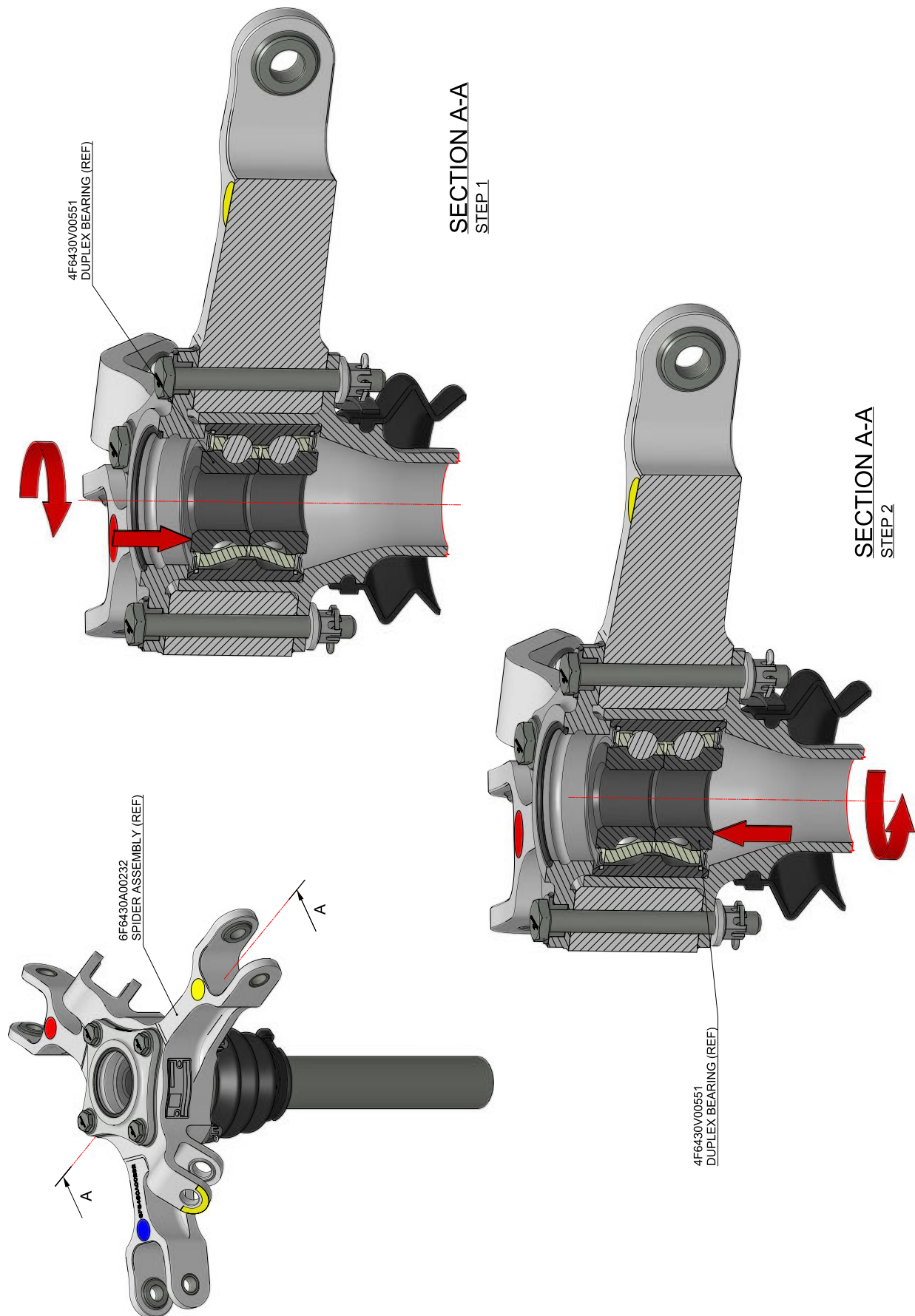
### NOTE

Do not use a thermal strip if after having trimmed it, its sensitive element is exposed to air. See below an example of a badly cut strip.



Thermal strip layers delamination.  
NOT acceptable.

**Figure 5**



**Figure 6**

**TABLE I**

<b>AIRCRAFT S/N</b>		<b>SB COMPLIANCE DATE:</b>	
<b>P/N 6F6730V00331 TRA S/N</b>		<b>A/C FH at SB COMPLIANCE DATE:</b>	
<b>TRA FH at SB COMPLIANCE DATE</b>		<b>A/C LANDINGS at SB COMPLIANCE DATE:</b>	

<b>ACTION</b>	<b>Required</b>	<b>Obtained</b>
<b>PART I</b>		
<i>CASTELLATED NUT paint mark check</i>	NO ROTATION BETWEEN PARTS	

**Figure 7**

**TABLE II**

<b>AIRCRAFT S/N</b>		<b>SB COMPLIANCE DATE:</b>	
<b>P/N 4F6430V00551 TR DUPLEX BEARING S/N</b>		<b>A/C FH at SB COMPLIANCE DATE:</b>	
<b>TR DUPLEX BEARING FH at SB COMPLIANCE DATE</b>		<b>A/C LANDINGS at SB COMPLIANCE DATE:</b>	

<b>ACTION</b>	<b>Required</b>	<b>Obtained</b>
<b>PART II</b>		
<i>TR DUPLEX BEARING wear and damages check</i>	NO FINDINGS	
<i>TR SPIDER axial play check</i>	ABSENCE of AXIAL PLAY	
<i>TR DUPLEX BEARING roughness check</i>	FREE AND EASY ROTATION	
<i>TR DUPLEX BEARING breakaway force check – Blue Arm, clockwise direction</i>	1.6 N thru 8.8 N	
<i>TR DUPLEX BEARING breakaway force check – Red Arm, clockwise direction</i>	1.6 N thru 8.8 N	
<i>TR DUPLEX BEARING breakaway force check – Yellow Arm, clockwise direction</i>	1.6 N thru 8.8 N	
<i>TR DUPLEX BEARING breakaway force check – Blue Arm, counterclockwise direction</i>	1.6 N thru 8.8 N	
<i>TR DUPLEX BEARING breakaway force check – Red Arm, counterclockwise direction</i>	1.6 N thru 8.8 N	
<i>TR DUPLEX BEARING breakaway force check – Yellow Arm, counterclockwise direction</i>	1.6 N thru 8.8 N	

**Figure 8**

**TABLE III**

<b>AIRCRAFT S/N</b>		<b>SB COMPLIANCE DATE:</b>	
<b>P/N 4F6430V00551 TR DUPLEX BEARING S/N</b>		<b>A/C FH at SB COMPLIANCE DATE:</b>	
<b>TR DUPLEX BEARING FH at SB COMPLIANCE DATE</b>		<b>A/C LANDINGS at SB COMPLIANCE DATE:</b>	

<b>ACTION</b>	<b>Required</b>	<b>Obtained</b>
<b>PART IV</b>		
<i>THERMAL STRIP Temperature check</i>	TEMPERATURE SHALL NOT REACH A VALUE EQUAL TO OR ABOVE 121°C.	

**Figure 9**

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**TABLE IV**

<b>AIRCRAFT S/N</b>		<b>SB COMPLIANCE DATE:</b>	
<b>P/N 4F6430V00551 TR DUPLEX BEARING S/N</b>		<b>A/C FH at SB COMPLIANCE DATE:</b>	
<b>TR DUPLEX BEARING FH at SB COMPLIANCE DATE</b>		<b>A/C LANDINGS at SB COMPLIANCE DATE:</b>	

<b>ACTION</b>	<b>Required</b>	<b>Obtained</b>
<b>PART V</b>		
<i>TR DUPLEX BEARING Particles check</i>	ABSENCE of ANY PARTICLES	
<i>TR DUPLEX BEARING Grease leakage check</i>	ABSENCE of METALLIC PARTICLES	

**Figure 10**

**TABLE V**

<b>AIRCRAFT S/N</b>		<b>SB COMPLIANCE DATE:</b>	
<b>P/N 4F6430V00551 TR DUPLEX BEARING S/N</b>		<b>A/C FH at SB COMPLIANCE DATE:</b>	
<b>TR DUPLEX BEARING FH at SB COMPLIANCE DATE</b>		<b>A/C LANDINGS at SB COMPLIANCE DATE:</b>	

<b>ACTION</b>	<b>Required</b>	<b>Obtained</b>
<b>PART VI</b>		
<i>TR DUPLEX BEARING Roughness check by fingers</i>	FREE AND EASY ROTATION	
<i>TR DUPLEX BEARING wear, damages and particles check on the inboard side of the bearing</i>	NO FINDINGS	

**Figure 11**

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# **ANNEX A**

## **UTC MICROTECNICA SERVICE BULLETIN 67-0006**



**UTC Aerospace Systems**

# **SERVICE BULLETIN**

**CIRCULATE PROMPTLY**

**PROPRIETARY**

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**TAIL ROTOR ACTUATOR (TRA)**  
**PN C181223-1**

**TORQUE CHECK AND RE-APPLICATION ON CASTELLATED NUT OF ROD**

Issue Issue – Nov. 21/18

Complete the revision on the title of cover page.  
IT Export Classification: NLR

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**UTC Aerospace Systems**  
**SERVICE BULLETIN**  
**CIRCULATE PROMPTLY**

**1. PLANNING INFORMATION**

**A. Effectivity**

All Microtecnica TAIL ROTOR ACTUATOR (TRA) reported in Table 1 (all S/N's).

**Table 1 – Components Affected**

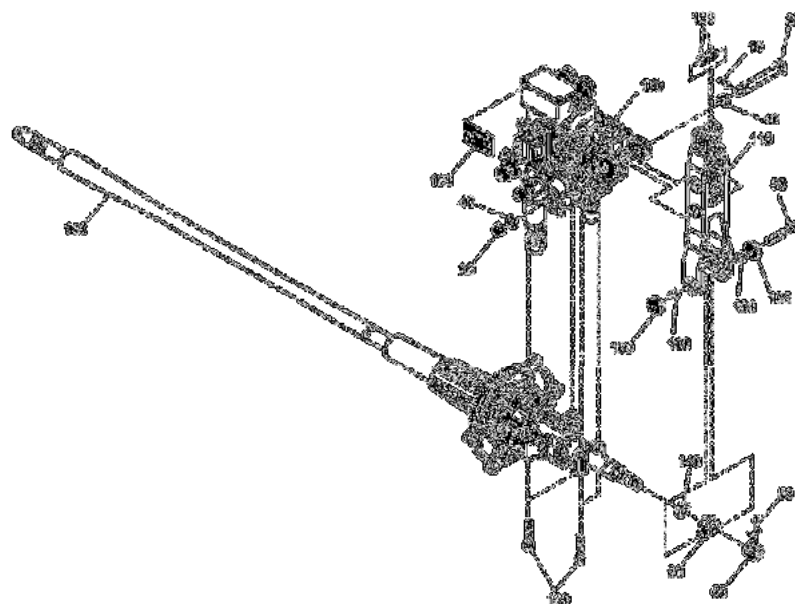
Nomenclature	Manufacturer Part Number (MT)	Type Certificate Holder Part Number (LH)	Manufacturer Cage Code
Tail Rotor Actuator	C161223-1	6F6730V00331	A0076

**B. Concurrent Requirements**

None.

**C. Reason**

To check and re-apply the torque of the castellated nut (80) connecting the rod (150) to the input lever (110) of the Tail Rotor Actuator (see Fig. 1a and 1b).



**Figure 1a**

Revis issue: Nov. 2013

Subject to the revision of the data on cover page.  
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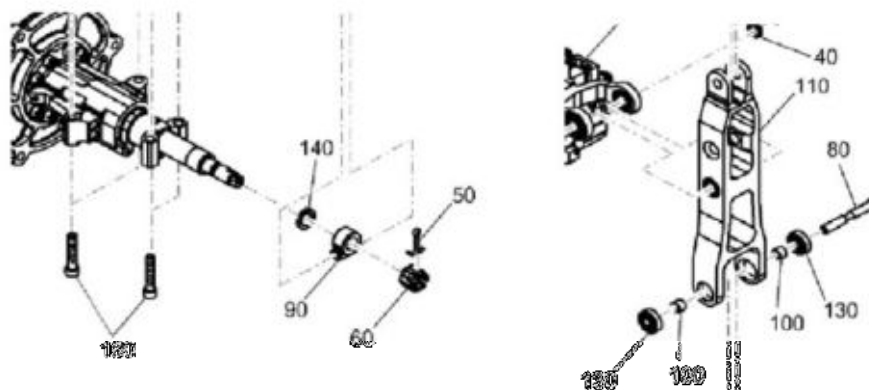


Figure 1b

Table 1.1 – List of Items

Item N. Inv. (Fig. 1)	Item Description
50	coiler pin
80	castellated nut
80	hinge bracket element
110	input lever
120	rod

## D. Description & Solution

This Service Bulletin gives the instruction to check and re-apply the Torque of the castellated nut (80).

## E. Compliance

It is recommended to introduce this Service Bulletin in accordance with Leonardo Helicopters Service Bulletin.

## F. Approval

Government or other regulatory agency approval of this service bulletin is the responsibility of Leonardo Helicopters.

## G. Manpower

The Manpower for the accomplishment of these operations is 1 hour.

## H. Weight and Balance

Not Affected.

## I. Electrical Load Data

Not Applicable.

Issue Issue – May, 21/12

Subject to the requirements of the applicable pages.  
IT Export Classification: N/A

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**J. Software Accomplishment Summary**

Not Applicable.

**K. References**

Not applicable.

**L. Other Publications Affected**

Not applicable.

**M. Interchangeability or Intermixability of Parts**

Not applicable.

**2. MATERIAL INFORMATION**

**A. Material Price and Availability**

The material is composed of the parts listed in the Table below.

Table 2.1 – List of parts

Part Number	Qty	MSQ	Keyword
3.2x20-03IN94 (Fig. 1 Item 30)	1		Cutter Pin

Note: all the above parts as per Table 2.1 can be locally procured.

All consumable materials are listed in Table 3.3, of para. 3.H.

**B. Industry Support Information**

This modification will be introduced in accordance with one of the options noted below:

- by organizational authorized helicopter maintenance personnel.
- by subcontracted maintenance personnel

**C. Material Necessary For Each Unit**

Locking Wire MS20005C20 in accordance with NAGM 33540.

**D. Material Necessary For Each Spare**

Locking Wire MS20005C20 in accordance with NAGM 33540.

**E. Reidentified Parts**

Not applicable.

**F. Tooling - Price and Availability**

Standard tools have to be used for the activities required by this Service Bulletin.

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IT Export Classification: NLR

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**3. ACCOMPLISHMENT INSTRUCTIONS**

**A. General**

All the values to be recorded as indicated in the following points have to be reported on the registration form in the last page of this Service Bulletin.

All the pictures taken as indicated in the following points have to be provided together with the registration form to Leonardo Helicopters within the completion time required by Leonardo Helicopters Service Bulletin.

**B. Cleaning procedure**

When necessary, cold solvent and a natural bristle brush or a cloth that does not contain any lint should be used to clean the external surfaces of the TAIL ROTOR ACTUATOR (TRA).

**C. Record the Torque on the castellated nut (60)**

1. Take a picture of the castellated nut (60) area of the Tail Rotor Actuator seen from the input lever (110) side (see Fig. 2 below for reference):



Figure 2

2. Check the paint mark for absence of evidence of rotation between the parts. **Record the result of the check** in the template provided at the end of this Service Bulletin.

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3. Cut and remove the locking wire.

4. Bend the cotter pin (50) end in order to re-align it with the hole in the rod (150). If cotter pin (50) is distorted by castellated nut (60) rotation, then rotate castellated nut (60) to allow cotter pin (50) removal.

5. Carefully remove the cotter pin (50) from its housing and scrap it.

6. Manual check if the castellated nut (60) is loose. **Record the result.**

If castellated nut (60) is loose then contact Leonardo Helicopters for further instructions.

7. Hold the squared end of the rod (150) (input lever side) using the proper socket or a standard wrench (8mm size). Set the calibrated torque wrench to 10 Nm and slowly tighten the castellated nut (60). Verify for relative rotation between the castellated nut (60) and the hinge bracket element (90). If no relative rotation is detected, then increase the setting of the torque wrench by 5 Nm at a time and repeat slowly tightening until the castellated nut (60) relatively rotates with respect to the hinge bracket element (90). **Record the value of the torque to have relative rotation.**

If no relative rotation is detected with a maximum tightening torque of **55 Nm**, then stop the tightening procedure and **record "torque greater than 55 Nm"**.

**D. Apply the Torque on the castellated nut (60)**

1. Remove the paint mark (as per Point 3.B) from the castellated nut (60), the rod end (150) and the hinge bracket element (90) using scotch brite and/or solvent (MEK or equivalent), see Fig. 1 for reference.

**Caution: in all the operation below, do not move the input lever (110), do not disconnect the input lever (110) from the rod (150).**

2. Apply tie rap on the input lever (110) as per Fig. 3.



Figure 3

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3. Hold the squared end of the rod (150) (input lever side) using the proper socket or a standard wrench (8mm size) and unscrew the castellated nut (60).
4. Carefully remove completely the castellated nut (60) from the rod (150) without disconnecting the hinge bracket element (90) from the rod (150).
5. Polish the castellated nut (60) surface of contact and clean it by means of abrasive paper (grit 600). Clean the hinge bracket element (90) contact area with lint free cloth. Sliding marks in the contact area of castellated nut (60) and hinge bracket element (90) are acceptable.
6. Clean the rod (150) thread with lint free cloth without using solvent. Note – the thread area may present a different colour because of molybdenum disulphate.
7. Apply a thin layer of grease as per MIL-PRF-81322 on the castellated nut (60) contact face.
8. Hold the squared end of the rod (150) (input lever side) using the proper socket or a standard wrench (8mm size) and slowly tighten the castellated nut (60) by means of calibrated torque wrench set to 40 Nm up to the contact with the hinge bracket element (90).
9. Check that the hole on the rod (150) is aligned with one of the available slots in the castellated nut (60). If the hole is not aligned, increase the torque wrench setting by 1 Nm per step and verify the alignment. The maximum applicable torque is 40 Nm. If the alignment is not achieved yet, unscrew the castellated nut (60) and repeat the torque application starting from 40 Nm. Record the applied torque.
10. Insert the new cotter pin (50) into the hole in the rod (150). Bend the cotter pin (50) end (the preferred configuration is shown in Fig. 2) in order to minimize axial or rotational cotter pin (50) movement.
11. Install the Locking Wire M820295C20 in accordance with NASM 83540 as per Fig. 2 in order to avoid castellated nut (60) unscrewing.
12. Cut and remove the tie rap from the input lever (110).
13. Apply a coloured paint mark on the castellated nut (60) from the hinge bracket element (90) to the rod (150) using a narrow brush as per Fig. 4.

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Observe the registration on the side of cover caps.  
IT Export Classification: N/A

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Figure 4

14. Mark "SB 67-0006" on the input lever (110) with permanent ink pen as per Fig. 5.



Figure 5

15. Take at least two pictures showing cotter pin (50), locking wire installation and coloured paint mark application.

16. Record compliance with this Service Bulletin SB 67-0006 on the relevant component log card.

**E. Re-identification**

Refer to Point C.19 of paragraph 3.

**F. Functional tests**

Not applicable.

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**G. SPARES**

Not applicable

**H. CONSUMABLE MATERIALS**

**Table 3.3**  
**List of consumables**

Material
Locking wire MS20995C20
Paint
Abrasive Paper (grit 800)
Grease MIL-PRF-61322
Solvent MEK

Note: all the parts as per Table 3.3 above can be locally procured.

**I. Requirement after job completion**

After the accomplishment of the procedure as per para. 3, complete the registration form situated at the bottom of this Service Bulletin and return it to Leonardo Helicopters within the completion time required by Leonardo Helicopters Service Bulletin.

 **UTC Aerospace Systems**  
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**AW169 – AW189**

**TAIL ROTOR ACTUATOR (TRA)  
PN C161223-1 (LH P/N 6F6730V00331)**

**Torque check and re-application  
on the Castellated Nut of the Rod**

**Customer Name:** \_\_\_\_\_

**Helicopter Serial Number:** \_\_\_\_\_

**Tail Rotor Actuator Serial Number:** \_\_\_\_\_

**C.2. Paint Mark no evidence of rotation (YearNo):** \_\_\_\_\_

**C.5. Castellated Nut loose (YearNo):** \_\_\_\_\_

**C.7. Value of the torque to have  
relative rotation between the  
Castellated Nut and the Hinge Bracket Element:** \_\_\_\_\_

**D.9. Value of the torque re applied to  
the Castellated Nut of the Rod:** \_\_\_\_\_

**Visual checks after the torque re-applied:**

- **D.11. The locking wire is properly installed:** \_\_\_\_\_
- **D.13. The parts are marked with paint:** \_\_\_\_\_
- **D.14. "SB 67-0006" is marked on the Input Lever:** \_\_\_\_\_

**Torque check and re-application to the  
Castellated Nut of the Rod  
accomplished by (Operator Name):** \_\_\_\_\_

**Execution date:** \_\_\_\_\_

Basic Issue: Nov. 2018

Get from the revision on the top of cover page.  
The next Classification: N/A

SB 67-0006  
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Please send to the following address:  <b>LEONARDO S.p.A.</b> <b>CUSTOMER SUPPORT &amp; SERVICES - ITALY</b>  <b>PRODUCT SUPPORT ENGINEERING &amp; LICENSES DEPT.</b> Via Giovanni Agusta, 520 21017 Cascina Costa di Samarate (VA) - ITALY Tel.: +39 0331 225036 Fax: +39 0331 225988		<b>SERVICE BULLETIN COMPLIANCE FORM</b>		Date:	
		Number:			
		Revision:			
Customer Name and Address:			Telephone:		
			Fax:		
			B.T. Compliance Date:		
Helicopter Model	S/N	Total Number	Total Hours	T.S.O.	
Remarks:					
Information:  We request your cooperation in filling this form, in order to keep out statistical data relevant to aircraft configuration up-to-date. The form should be filled in all its parts and sent to the above address or you can communicate the application also via Technical Bulletin Application Communication Section placed in Leonardo AW Customer Portal - MyCommunications Area. We thank you beforehand for the information given.					